



# Pregnant Women and Unborn Babies Susceptibility to Endocrine Disrupting Chemicals

## WECF Position Paper

**A significant number of studies<sup>1</sup> show that the placenta does not provide a strong defence against harmful chemicals, as once previously thought.<sup>2</sup> In fact, the prenatal development stage is one of the most susceptible to health risks caused by chemical exposure.<sup>3</sup> Endocrine Disrupting Chemicals (EDCs) are a particular group of chemicals that can cause damage to the foetus development and have long-term adverse effects. EDCs can be found in a variety of products, ranging from cosmetics to children's clothing, food and many others. It is important to raise public and political awareness on this issue so that pregnant women can be informed and protected from EDCs that can harm their unborn child.**

### **What are EDCs and how do they affect pregnant women and the unborn baby?**

According to the World Health Organization, "An endocrine disruptor (ED) is an exogenous substance or mixture that alters functions of the endocrine system and consequently causes adverse health effects in intact organism, or its progeny, or (sub)populations."<sup>4</sup> In other words, an ED is a substance that is foreign to the organism (also called xenobiotic) and disrupts the natural process of the endocrine (hormone) system, which can then damage the health of human beings. The endocrine system is a complex system, made up of the organs (and glands) that communicate to the body through hormones. Hormones are messengers sent by the endocrine glands that tell the body when to grow, reproduce, digest food, and even how to

respond to stressful situations. Examples of these organs and glands in females include: the ovaries, uterus, and mammary glands. Examples in both females and males are the thyroid, pituitary and adrenal glands. Given the complexity and fragility of the endocrine system's balance, the effects and mechanisms of action of EDCs can be various. They interfere with the communication between endocrine glands and target cells. For example, natural hormones can be blocked from making contact with the target cells because the foreign chemical acts like a hormone and supplants itself in the cell instead. Thus, developmental or hormonal health problems arise because our cells are not receiving the right messages at the right time.

### **Vulnerable groups**

Women and girls are especially vulnerable to the effects of hormone disruption during crucial stages of development.<sup>5</sup> One of these crucial stages is the organogenesis phase of prenatal development, i.e. the process of organ formation in a foetus.<sup>6</sup> This process creates the endocrine organs that control development and reproduction. If the foetus is exposed to EDCs during this period of time, the organs may not receive the right messages to develop properly, potentially causing long-term health problems. These health problems may not appear until much later in life when the organs are supposed to trigger development. Examples of this manifestation include but are not limited to: Premature Menarche (first menstrual period), thyroid disruption, uterine

fibroids (benign tumours of the uterus), Polycystic Ovarian Syndrome, Testicular and Breast Cancer.<sup>7</sup>

### **Low-dose**

EDCs are also suspected to have a combination or "cocktail effect" on organisms, in which small amounts of several substances mixed together may cause health problems. Next to the cocktail effect there is also the low dose non-linear effect of EDCs<sup>8</sup>. This describes how low doses of chemical exposure over a longer period or in a particularly vulnerable period of development may exert stronger effects than higher doses. There are many scientific experiments and examples that illustrate how EDCs harm pregnant women and their foetuses.<sup>9</sup> Unfortunately, many of the results cannot prove direct causation between EDCs and long-term health problems in humans, due to obstacles such as the complexity of the mechanisms at stake, the existence of other variables contributing to health problems, or the latency period of the diseases. However, there is enough scientific evidence showing that EDCs pose a threat to human health and the environment.<sup>10</sup>

### **DES tragedy**

One wellknown example of disease manifestation in human beings unequivocally caused by an EDC is the DES tragedy. "In the late 1940s, pregnant women with a history of miscarriage or premature birth were offered a new preventative drug: an estrogenic pharmaceutical called diethylstilbestrol (DES)."<sup>11</sup> This drug was prescribed to prevent miscarriages or premature birth in



pregnant women until a study showed that several young women, whose mothers took DES during pregnancy, had a rare vaginal cancer in addition to other health problems. The cancer, clear cell adenocarcinoma, had essentially never been seen in women under 50 until this moment. Instead of solving reproductive problems, the drug actually caused more. This tragic event showed the world how EDCs negatively affect human beings (i.e. the epidemiology of EDC caused diseases) by: impacting the health of the foetus without affecting the mother, illustrating how foetuses are especially susceptible to health risks from EDC exposure, and linking diseases that appear later in life to early developmental exposures.

#### **Which products contain EDCs?**

Actually, an easier question might be which product does not contain EDCs. EDCs can be found in a variety of consumer goods and building materials that include but are not limited to: cosmetics, cleaning supplies, baby care products, toys, baby bottles, plastic containers, furniture, paint, and flooring. It may seem like it is virtually impossible to eliminate EDCs exposure entirely, but there are ways to avoid products that have the highest risk of EDC exposure. For example body care products: many body lotions or creams contain parabens which have endocrine disrupting properties.<sup>12</sup> These products are regularly used by pregnant women. The avoidance or substitution of these products can significantly decrease the risk of EDC exposure to pregnant women and the foetus.

The scientific study, "Exposure of Pregnant Consumers to Suspected Endocrine Disrupters," published by the Danish Environmental Protection Agency, assesses consumer products containing EDCs and determines the products that pose the greatest threat to pregnant women. According to the study, these products are: propyl- and butylparabens 3 (paraben) in creams and sunscreens, OMC in sunscreens, triclosan in deodorant and toothpaste, nonylphenol (can be avoided by washing new clothes) and phthalates in

various consumer products as well as in house dust.<sup>13</sup> The study supports the dose-addition model, "which is based on the fact that as increasing doses of a single substance can cause increasing effect, the co-presence of several substances (acting in the same way) can give an effect similar to an increased dose of a single substance."<sup>14</sup> The study illustrates the cocktail effect in humans and also addresses how pregnant women have the power to actually substitute or change the aforementioned products and habits, compared to other EDCs containing goods and substances that are hard to avoid.

The products and materials listed in this section are not exhaustive. To find out more about EDCs containing mixtures and goods that could especially affect the foetus and early childhood, please reference WECF's Project Nesting website at [www.projectnesting.org](http://www.projectnesting.org).

#### **Loopholes and Flaws of Regulation**

##### *European Union Policy*

Although the WHO's International Programme on Chemical Safety (IPCS), "covers all chemicals, natural and manufactured," in international chemical management, there are several loopholes and flaws that disregard this principle when practiced on a regional level. For example, Regulation EC 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) and the EU Cosmetics [Regulation EC 1223/2009](http://www.europecosmetics.eu), currently exclude EDCs from their dossiers (chemicals listed in the regulation), even if REACH allows listing of EDCs on the Candidate List to substitution as substances of equivalent concern to Substances of Very High Concern (SVHC)<sup>15</sup>. On the 11<sup>th</sup> and 12<sup>th</sup> of June 2012, the European Commission organized a conference on "Endocrine Disruptors: Current challenges in science and policy," recognizing that the current scientific evidence on EDCs supported the need for action.<sup>16</sup> However, even if these arguments motivate the decision to include EDCs in the Commission's June 2013 review of REACH, there will still be loopholes allowing for EDCs use in

cosmetic products due to the Cosmetics regulation. Hopefully, EDCs will be covered by the Cosmetics regulation once the revision of the EU Strategy on Endocrine Disrupters is adopted in November 2013, and a common definition of EDCs is adopted at EU level. Other examples are the Biocidal Products Regulation (EU) 528/2012, which bans the use of EDCs but allows for exemptions, and the Toys Safety Directive 2009/48/EC, which fails to address EDCs whereas it is especially designed to regulate children's products.

In spite of loopholes and flaws in EU chemical legislation, recognizing, discussing and publicizing EDC concerns allows for EU member states to initiate their own EDC protocol. In August 2012, the Danish Government has decided to ban 4 phthalates in indoor products (EDCs: DEHP, DBP, DIBP and BBP) after the European Chemical Agency (ECHA) rejected the restriction on the EU level<sup>17</sup>. Denmark has already influenced the Bisphenol A (a chemical which is widely used in many all day products like cash receipts, plastic bottles, toys, clothes etc.) ban on the EU level by initiating the policy first, and continues to be a leader in sustainable chemical policy for all EU member states. In December 2012, France adopted a ban of BPA in food packaging to be in force in January 2015, and already implemented for food containers for children under 3 since January 2013<sup>18</sup>.

##### *International Policy*

In 2002, implementation Plan of Johannesburg World Summit on Sustainable Development urged governmental and institutional partnerships to use and produce chemicals by 2020 in ways that do not lead to significant adverse effects on human health and the environment. As follow up of the World Summit an institutional frame for chemical management were implemented on UN level (SAICM- (Strategic Approach to International Chemicals Management). One function of is SAICM is "to focus attention and call for appropriate action on new emerging policy issues as they arise and to forge consensus on priorities



for cooperative action.”<sup>19</sup> In agreeing on priorities for cooperative action, the international community of states demands to see EDCs emerging issues of global concern.<sup>20</sup> This was the first time “potential adverse effects of endocrine disruptors on human health and the environment” have been recognized on a global level.<sup>21</sup> Additionally, the joint WHO/UNEP report on the *State of the Science of Endocrine Disrupting Chemicals*<sup>22</sup>, published in February 2013 makes a number of recommendations to improve global knowledge of EDCs, reduce potential disease risks, and cut related costs.

#### **WECF’s position on EDCs**

Endocrine Disrupting Chemicals pose serious threats to the health of women and children, particularly pregnant women and their unborn babies. WECF recognizes the need for scientific evidence showing the risks and hazards of EDCs exposure to humans and the environment but strongly supports implementing a precautionary principle based approach when assessing EDCs and regulating them. WECF is very concerned about human exposure to EDCs without assessment, and the lack of regulation of the risks involved. Lessons learned from the past and the potentially devastating effects of ignoring the warnings on the use of certain consumer products and industry materials suspected or known to be hazardous—such as DES asbestos—should be remembered<sup>23</sup>. To avoid health and environmental damage, consumers and the general public must be informed and involved in decision-making regarding EDCs. WECF believes that pressure from international initiatives from UNEP and WHO could motivate regional powers and national governments to react timely to a scientific body of evidence and pass legislations favouring human and environmental health over placing on the market of unregulated potentially hazardous compounds. And finally, companies must be engaged in assuring the long-term safety of their products.

**WECF calls for eight actions to be taken on EDCs by policy makers**

- 1. Establish a Global Watch List of chemicals with potential endocrine disrupting properties.**
- 2. Provide information on uses of EDCs and corresponding lists of safer chemical and non-chemical alternatives for said uses.**
- 3. Raise global and public awareness on endocrine disruption, through broad outreach, information exchange and capacity building campaigns, with the participation of environmental and health NGOs and scientific institutions.**
- 4. Use biomonitoring information generated by scientists and public interest NGOs in information exchange programs.**
- 5. Ensure that UNEP’s and WHO’s proposed international network on EDCs retains SAICM’s multi-stakeholder nature and includes experts in endocrinology as well as representatives of public interest NGOs, trade unions, and the health sector.**
- 6. Prioritize health and environment policies that aim at eliminating the exposure to EDCs of the most vulnerable, including women of reproductive age, unborn and newborn babies, and children.**
- 7. Improve how the characteristics of EDCs are addressed in human health and environmental hazard assessments and support better management decision making and prioritization with better scientific understanding, attention to the effects of chemical mixtures, and the development of assessments based on a life-cycle, precautionary approach.**
- 8. Develop tools, resources, and guidelines for national assessment of production, import and export, use, and disposal of EDCs and potential EDCs, including private sector**

**obligations, with particular attention to the use and disposal phase, that could lead to exposure of those most vulnerable. Develop and assemble, when available, best practices of environmentally sound management of wastes containing EDCs.**

**9. Take sufficient measures for protecting human health and environment, e.g. ban of hazardous substances and commit industry to take responsibility for produced damage.**

**10. Take action on EU level for strong criteria for EDCs. Regulations only really have a protective effect if as many EDCs as possible are classified as EDCs.**



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WECF – Women in Europe for a Common Future e. V.  
Sankt-Jakobs-Platz 10  
80331 München  
[www.wecf.eu](http://www.wecf.eu)

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